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(54) **Surface treatment method and surface treatment apparatus**

(57) A subject (W) which is to be treated and on which an oxide film is formed, is carried into a treatment vessel (10), and the treatment vessel is maintained under vacuum. A mixture gas of N₂ gas and H₂ gas is introduced into a plasma generation section (30), plasma is generated, and activated gas species of the N₂ and H₂ gases are formed. The activated gas species are caused to flow toward the subject, and an NF₃ gas is added to the activated gas species and activated to generate an activated gas of N₂, H₂ and NF₃ gases. The subject (W) is cooled to not higher than a predetermined temperature by a cooling means and reacted with the activated gas of NF₃ gas. The oxide film is thus degenerated into a reactive film. When the supply of N₂, H₂ and NF₃ gases into the treatment vessel (10) is stopped, the subject is heated up to a predetermined temperature by a heating means, and the reactive film is sublimated and eliminated. Thus, a surface treatment method for removing the oxide film from the subject and a surface treatment apparatus for doing the same are disclosed. Furthermore, the surface treatment apparatus and other treatment apparatuses constitute a cluster system capable of carrying the subject in an unreactive atmosphere.

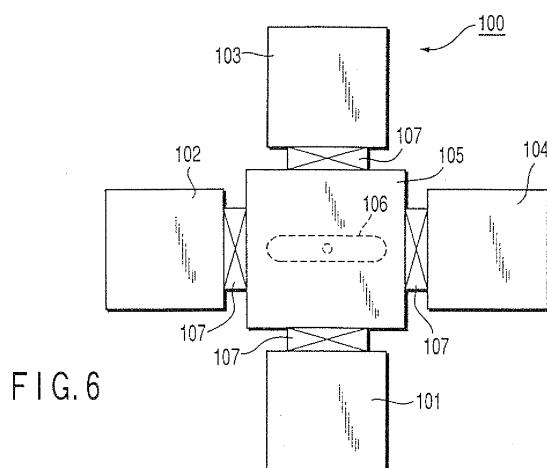


FIG. 6



EUROPEAN SEARCH REPORT

Application Number
EP 08 16 1431

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 21 September 2011	Examiner Keller, Jan
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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